Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C.

In re:

Amendment of Parts 2, 21, 25 and 94 of the Commission's Rules to Accommodate Common Carrier and Private Op-Fixed Microwave Systems in Bands Above 3 GHz	)))))	RM-8004

Reply of Hughes Communications Galaxy, Inc.

Hughes Communications Galaxy, Inc. ("HCG") hereby replies to the statements in support, and the statements in opposition, of the petition for rulemaking (the "Petition") filed by Alcatel Network Systems, Inc. ("Alcatel") in this matter. These statements confirm that Alcatel simply has not justified the disruptive effects its proposal would have on the satellite industry.

I. Introduction.

In response to the Commission's proposal to allocate 220 MHz of spectrum to emerging telecommunications technologies, and eventually to displace certain fixed microwave service users,[1] Alcatel proposes that the Commission accommodate these displaced microwave users in the 4 GHz and lower 6 GHz bands that are now used for the C band domestic fixed-satellite communications service. Alcatel suggests that the Commission (i) reallocate frequencies in the 4 GHz and lower 6 GHz bands to allow displaced microwave systems to operate there on a co-

[1] See In re Development of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies, 7 FCC Rcd 1542 (1992) (the "Emerging Technologies Docket").

primary basis, (ii) rechannelize those bands into smaller segments, and (iii) reduce to a secondary basis the use for satellite communications of 80 MHz of the 500 MHz now allocated for co-primary use by satellite communications and terrestrial services.

As the Statements filed in this proceeding bear out, Alcatel's proposal is deficient because it fails to even consider the devastating consequences of its proposed reallocation and rechannelization.

II. Reallocating 80 MHz of the C Band for Secondary Use Is Not Justifiable.

HCG demonstrated in its Statement in Opposition to the Petition that Alcatel's proposal to strip away 16% of the spectrum now used for C band satellite services would severely disrupt the entire satellite industry. GTE Service Corporation ("GTE"), GE American Communications, Inc. ("GE"), and Home Box Office ("HBO") all agree that this proposal simply is untenable and is inconsistent with the Commission's policies with respect to the satellite industry. MCI Telecommunications Corporation also agrees that such a reallocation would cause the satellite industry to suffer unnecessarily.

The parties who have filed Statements in support of the Petition state the obvious: some accommodation needs to be made for microwave users who may be displaced from the 2 GHz band in the future by emerging technologies. HCG does not dispute this. But no one who supports Alcatel's proposal to render useless 4 of the 24 transponders on each C band satellite even purports to

analyze the ultimate effects of this proposal, or to suggest how the Commission should accommodate the C band services that would be displaced. Nor does anyone attempt to address how the Commission could impose such a proposal in a manner that is consistent with the use of the 3.7-4.2 GHz band by Canadian and Mexican satellites.

As HCG explained in its Statement in Opposition, and as HBO, GTE and GE confirm, it would devastate the satellite industry to adopt Alcatel's proposal to reduce to a secondary basis the use of 16% of the spectrum currently used for C band satellite services. The growing demand for C band spectrum is well documented in Commission proceedings. For example, in 1988, the Commission affirmed its 1983 decision to reduce C band (and Ku band) satellite orbital spacing in order to maximize the number of satellites that could be accommodated in orbit, and to ensure that the increasing demand for satellite services could be met in the future.[2] Moreover, the Commission recently was faced with petitions for rulemaking to increase orbital spacing and thereby reduce available C band capacity by an estimated 20%.[3] Just this year, the Commission unanimously rejected these petitions and reaffirmed its commitment to maximize the amount of capacity available for satellite services.[4] Alcatel's proposal to reduce the available C band spectrum by 16% must fail for the

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2 See 1988 Orbit Assignment Order, 3 FCC Rcd 6972, ¶ 5 (1988).

3 See Amendment of C band Orbital Spacing Policies, 7 FCC Rcd 456, 459 (1992).

4 Id.

same reasons: it would cause unnecessary costs, severe disruption, uncertainty and instability in the satellite industry.[5]

III. Alcatel's Rechannelization Plan Would Increase Potential Interference

HCG agrees with GE and GTE that Alcatel's proposal to rechannelize the 4 GHz band is a recipe for disaster. Alcatel's proposal would disrupt the coordination procedures that have allowed satellite users and terrestrial microwave users to co-exist for the last two decades, and would lead to increased interference into earth stations. Almost all C band users would be affected by the Alcatel proposal, including cable headends and television receive-only ("TVRO") dish owners (both registered and unregistered).

Currently, satellite services share the 4 GHz band on a co-primary basis with terrestrial microwave services. Because of this sharing, C band satellite receive systems often encounter terrestrial C band interference. Even though terrestrial use of this spectrum is heavy, existing channelization and coordination methods are a relatively effective means of allowing these two competing uses of the spectrum to co-exist.

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[5] Harris Corporation's proposal to delete the C band satellite service entirely by moving it to the Ku band surely merits no serious consideration. Aside from turning upside down the entire satellite industry, into which billions of dollars are being invested, Harris' proposal is fundamentally inconsistent with the Commission's expressed commitment to the satellite industry and its 2° orbital spacing policy. See id.

For terrestrial use, the 4 GHz band is broken down into 20 MHz "wideband" channels. For satellite communications, nominal 40 MHz transponders are the standard in C band. In order to optimize the use of available spectrum, while also minimizing the risk of interference, C band satellite transponders are aligned so their center frequencies are located in the middle of the terrestrial 20 MHz channels. In other words, the terrestrial channels and the satellite channels are interwoven in such a way that center frequencies of the channels (where most of the energy is centered in an analog signal) are spaced as far apart as possible. That is, the center frequencies are offset by ± 10 MHz. See Figure 1 attached. This allows satellite receivers to screen out the edges of the transponder where terrestrial interference may be present.

A specific example helps to illustrate this scheme. Consider a satellite transponder that operates in the 3800-3840 MHz range. Most of the energy transmitted to carry a video signal is concentrated in a 15 MHz (or smaller) band at the center of the 40 MHz transponder. Earth stations in congested urban markets (such as TVROs) often are able to co-exist with microwave facilities through a combination of using filters and employing other interference reducing means. By utilizing filters, an earth station often can cut off the upper and lower 12.5 MHz of the transponder's frequency band without adversely affecting the quality of the signal that it desires to receive.[6]

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[6] This method may not work with digital or HDTV video signals of the future. See pages 7-8, infra.

See Figure 2 attached. This effectively eliminates potential terrestrial interference because the unwanted terrestrial signals are centered in the portion of the frequency that the filters eliminate. Thus, little interference occurs in the "heart" of the video signal.

Alcatel's proposal to rechannelize the 4 GHz band would make earth station coordination even more difficult. Alcatel does not propose to coordinate and implement displaced microwave users in the 4 GHz band in a manner that is consistent with industry practice. Instead, Alcatel suggests breaking down the existing 20 MHz channels into smaller channels that range from 400 KHz to 10 MHz. The fundamental problem with breaking down the 20 MHz channels is that it will destroy the interleaving of frequencies that allows satellite and terrestrial users to successfully share the same band.

Under Alcatel's proposal, most of the terrestrial band would be segmented into 10 MHz channels. This would provide an offset of only 5 MHz between the 10 MHz terrestrial channels and the 40 MHz satellite channels. As a result, each satellite transponder could be flanked by a terrestrial channel only 5 MHz away. Returning to the example above, if a video signal were carried on this transponder, terrestrial signals would be present in the very heart of the video signal. From the perspective of a TVRO user, the interference now might be insurmountable. While he previously could install a filter that suppresses the interfering terrestrial signals (when those signals were located outside the center of the video signal), filters that now would

suppress the terrestrial channels would also suppress critical portions of the desired video signal. See Figure 3 attached. Obviously, this is an unacceptable result. Alcatel simply fails to address this consequence of its proposal.

IV. Reallocating the C Band for Additional Microwave Uses Raises Other Significant Issues

HCG does not object to sharing the C band spectrum with displaced microwave users, as long as they coordinate and implement their systems in accordance with existing industry practices at C band. However, two factors should be considered before adding to the existing congestion in C band: (1) the Commission should consider the effect of rechannelization on the transmission of digital video or HDTV signals by satellite, and (2) the Commission should address whether displaced microwave users could reduce their need for spectrum by using the available spectrum more efficiently.

In Reply Comments filed on July 8, 1992 in the Emerging Technologies Docket (ET 92-9), the Satellite Broadcasting and Communications Association ("SBCA") explained that, even absent the effects of the proposed rechannelization, use of the 4 GHz band by displaced microwave users presents problems for TVRO dishes. It also explained that, when it comes to digitally compressed or modulated video signals (and HDTV signals) that may be delivered by satellite, TVRO dishes may not be able to defeat terrestrial interference by conventional filtering methods without rendering the desired video signal unusable. This

consequence should be addressed before allowing additional microwave users into the 4 GHz band.

At a time when available spectrum is becoming scarcer and scarcer, it is incredible that Alcatel proposes to actually increase the amount of spectrum available for displaced microwave services by disrupting the satellite industry.[7] HCG agrees with GTE's suggestion that microwave users should be required to improve the efficiency with which they use spectrum before the Commission provides them with additional resources. For years, satellite operators and users have been at the forefront of maximizing full use of the available C band spectrum. All new C band spacecraft are designed to provide full reuse of the 500 MHz allocated to them. Moreover, the satellite industry has maximized the use of its allocated spectrum by reducing orbital spacing and improving antenna specifications. Microwave performance users should be required to do no less. And they should be allocated no additional spectrum until they do so.

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[7] See Petition at 4.

V. Conclusion.

Alcatel's petition fails to justify the proposed disruption it would cause to the satellite industry and raises more problems than it purports to solve. The Commission should dismiss the petition without further consideration.

Respectfully submitted,

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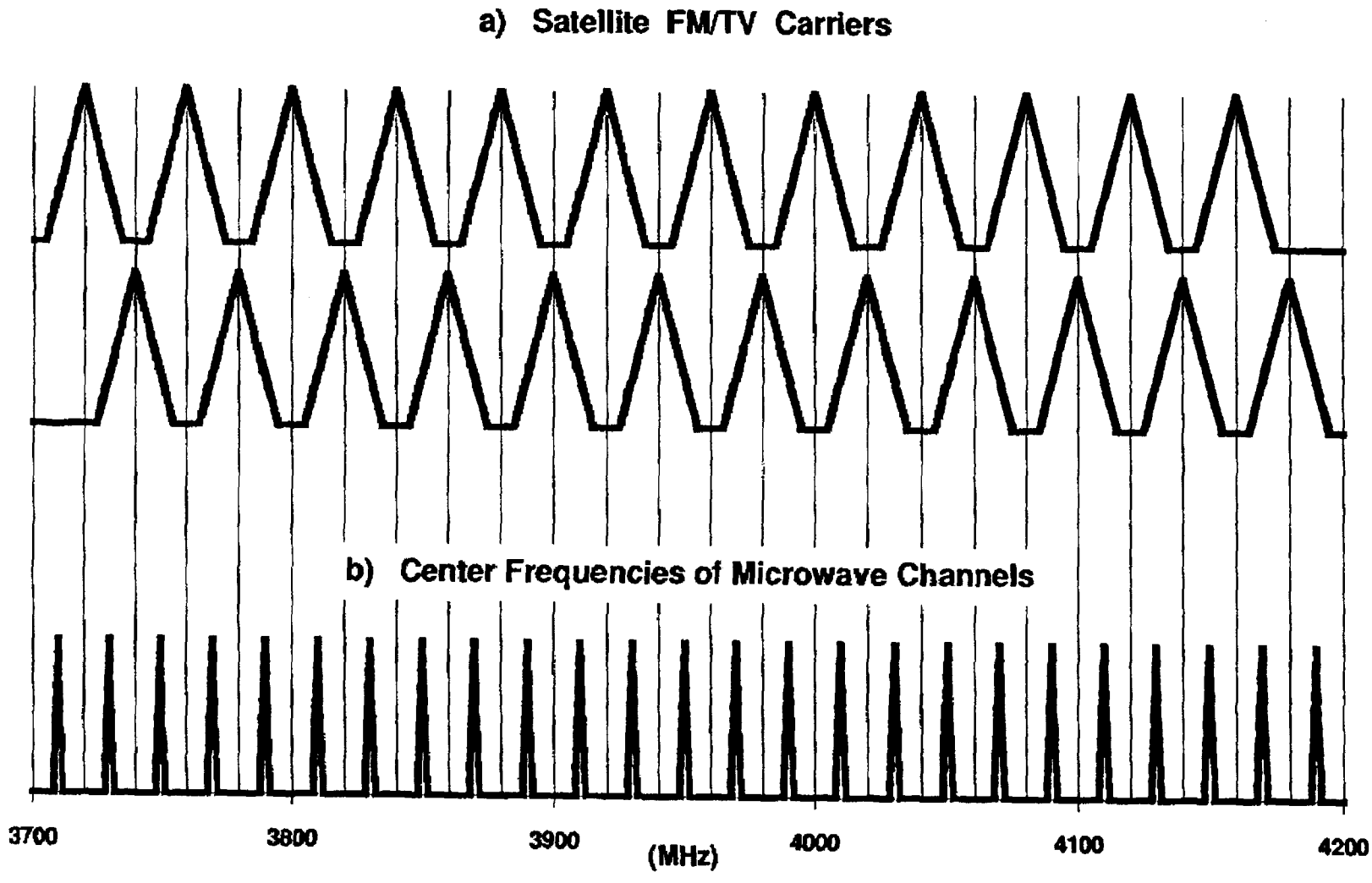

Figure 1. Present Frequency Assignment for Satellite Transponders and Terrestrial Microwave Systems

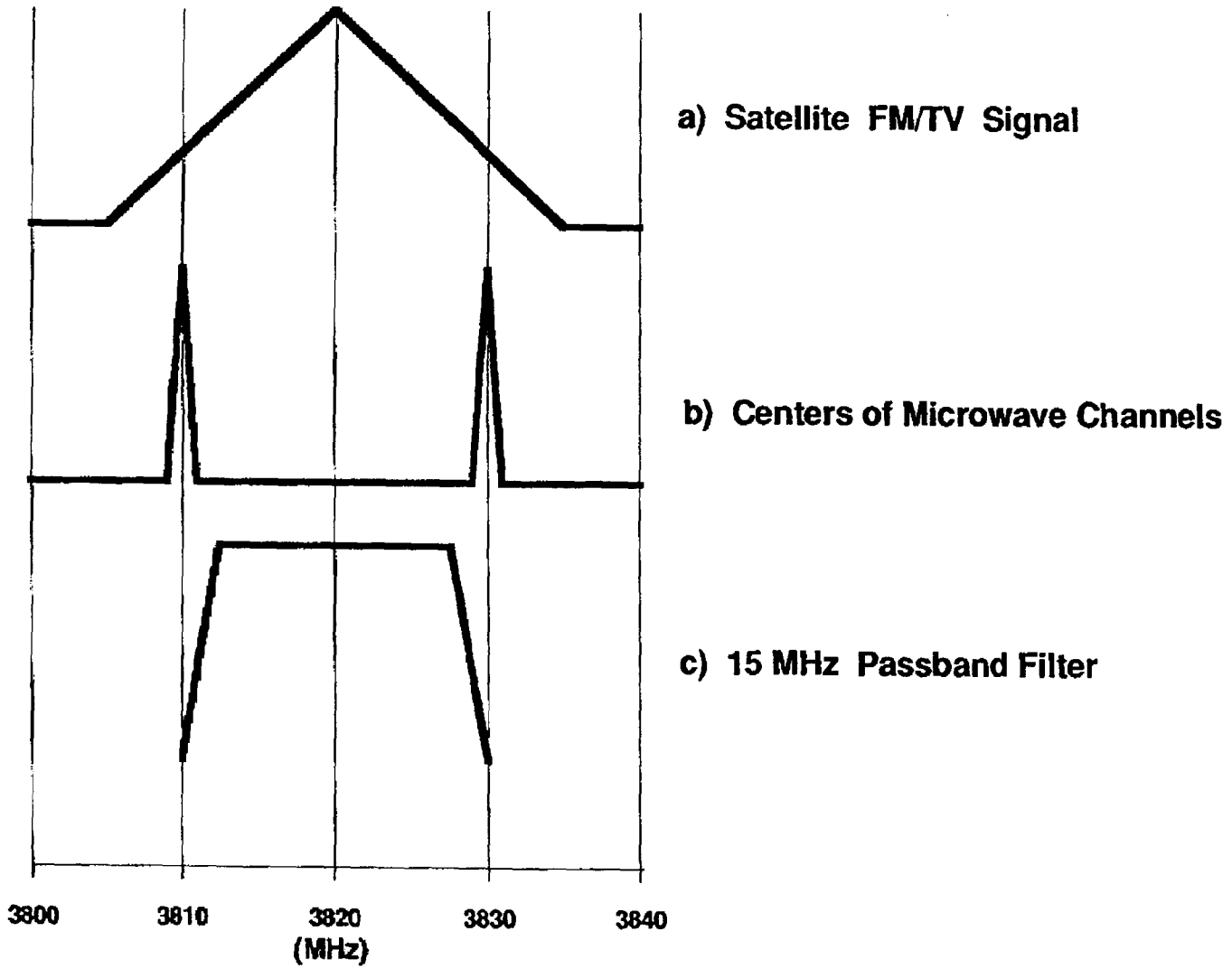

Figure 2. Example of a Passband Filtering Approach to Combat Interference Entering Satellite Receive Antennas from Terrestrial Microwave Systems

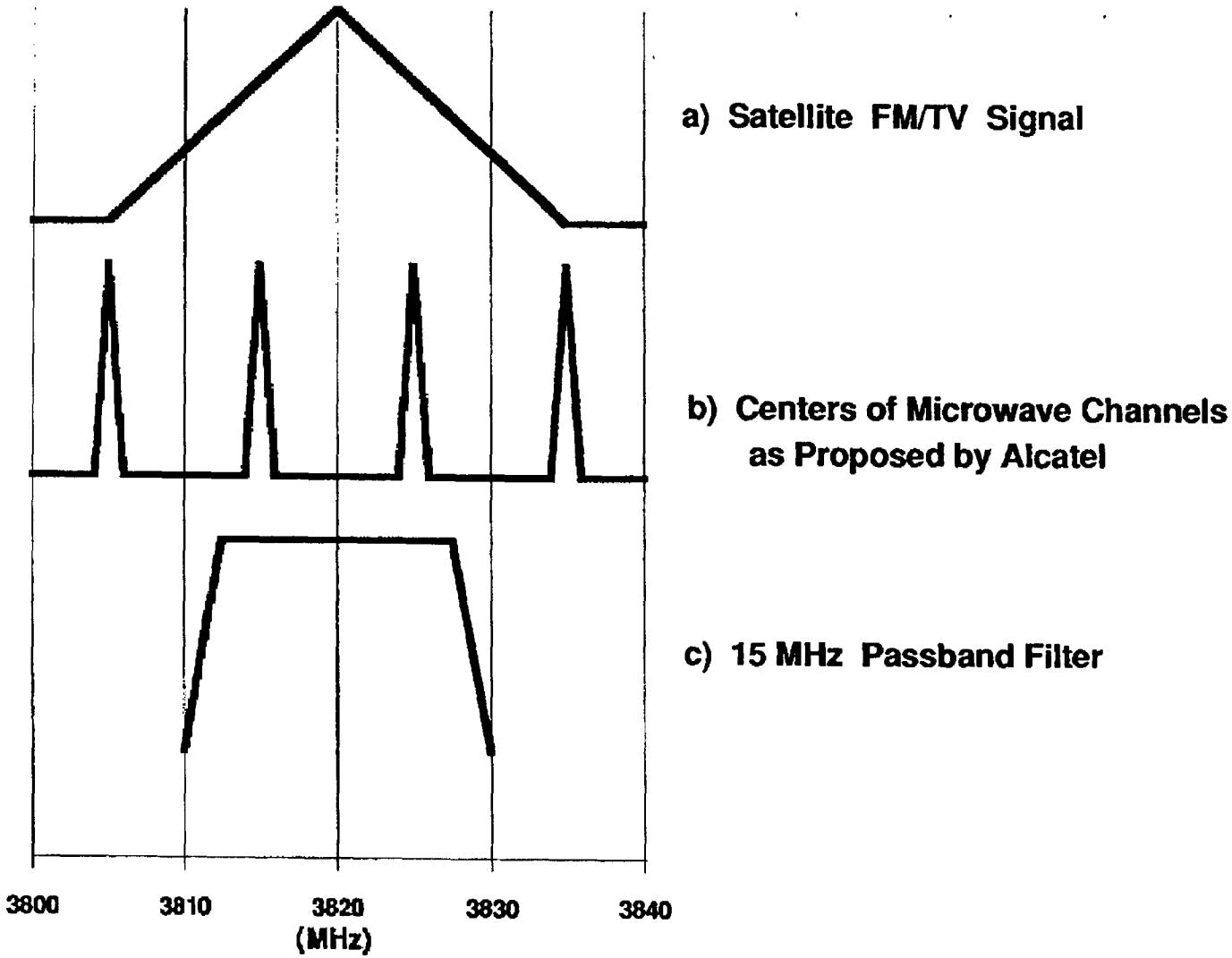

Figure 3. Passband Filtering Useless to Combat Proposed Rechannelized Microwave Frequency Plan

CERTIFICATE OF SERVICE

I, Bridget M. Shannon, do hereby certify that the attached Reply of Hughes Communications Galaxy, Inc. was mailed, postage prepaid, this 17th day of July, 1992, to the following:

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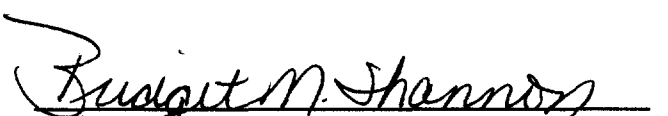

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